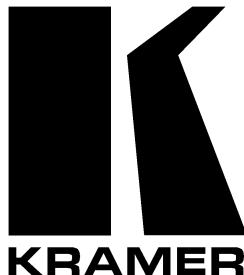


**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**WP-220**

*XGA/Audio/Video Line Driver*

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Getting Started</b>	<b>1</b>
<b>3</b>	<b>Overview</b>	<b>1</b>
<b>4</b>	<b>Your WP-220 XGA/Audio/Video Line Driver</b>	<b>2</b>
4.1	Your WP-220 Front Panel	3
4.2	Your WP-220 Left Panel	4
4.3	Your WP-220 Right Panel	4
4.4	Your RGBHV Outputs	5
<b>5</b>	<b>Using the WP-220 XGA/Audio/Video Line Driver</b>	<b>5</b>
5.1	Installing the WP-220 XGA/Audio/Video Line Driver	6
5.2	Operating the WP-220 XGA/Audio/Video Line Driver	7
<b>6</b>	<b>Technical Specifications</b>	<b>9</b>

## Figures

Figure 1: WP-220 Front Panel	3
Figure 2: WP-220 Left Panel	4
Figure 3: WP-220 Right Panel	4
Figure 4: WP-220 RGBHV Outputs	5
Figure 5: Example of Conference Room WP-220 Installation	5
Figure 6: Connect to a Balanced Acceptor	6
Figure 7: Connect to an Unbalanced Acceptor	6
Figure 8: Connecting the WP-220	8

## Tables

Table 1: WP-220 Front Panel Features	3
Table 2: WP-220 Left Panel	4
Table 3: WP-220 Right Panel	4
Table 4: Technical Specifications of the WP-220 XGA/Audio/Video Line Driver	9

This addendum adds the following information to the user manual:



**Caution** – No operator-serviceable parts inside unit.

**Warning** – Use only the Kramer Electronics input power wall adapter that is provided with this unit<sup>1</sup>.

**Warning** – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

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<sup>1</sup> For example: model number AD2512C, part number 2535-000251

**ADDENDUM: WP-210, WP-210E, WP-210A, WP-210AE, WP-210AL, WP-220,  
WP-220E, and WP-230.**

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This addendum clarifies the correct color of the V sync and H sync coax cables.

The color of the coax cables with all Kramer Wall Plates, including the **WP-210, WP-210E, WP-210A, WP-210AE, WP-210AL, WP-220, WP-220E, WP-230** will be as follows:

- For V sync (vertical sync) – black<sup>1</sup>
- For H sync (horizontal sync) – yellow<sup>2</sup>

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<sup>1</sup> No longer yellow

<sup>2</sup> No longer white



## 1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups<sup>1</sup>, which are clearly defined by function.

Congratulations on purchasing your **WP-220 XGA/Audio/Video Line Driver** active wall plate<sup>2</sup>, which is ideal for graphics and audio installations in board, conference and training rooms, as well as long distance signal distribution.

The package includes the following items:

- **WP-220 XGA/Audio/Video Line Driver**
- This user manual<sup>3</sup>

## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables<sup>4</sup>

## 3 Overview

The **WP-220 XGA/Audio/Video Line Driver** is a wall plate adapter that includes:

- 2 video inputs (an XGA input on a standard HD-15 connector, and a composite video input on an RCA connector)
- 2 video outputs (an amplified and equalized RGBHV output on 5 BNC

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<sup>1</sup> GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

<sup>2</sup> In addition to our active wall plate devices, Kramer's WP series consists of passive wall plate and passive connection modules that work with the WP Frame and/or the VPM-2 XGA Line Driver wall plate

<sup>3</sup> Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com/manuals.html>

<sup>4</sup> The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com> (click "Cables and Connectors" in the Products section)



connectors, and a video output 2-pin connector that connects to the coax cable (one pin is for the composite video signal, and the other is for the Ground))

- 2 unbalanced stereo audio inputs (a PC audio input on a 3.5mm mini jack, and an audio line input on left and right RCA connectors)
- 2 balanced stereo audio outputs (a PC audio output on a terminal block connector, and an audio line output on a terminal block connector)

In particular, the **WP-220** has:

- Left and right audio level controls
- EQ. control to adjust the XGA cable compensation (equalization) level
- EQ., and level controls to adjust the CV cable compensation (equalization) level
- Video bandwidth of 500MHz, that ensures transparent operation for all resolutions
- A standard 12 Volt DC feed

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances and positioning your **WP-220** away from moisture, excessive sunlight and dust

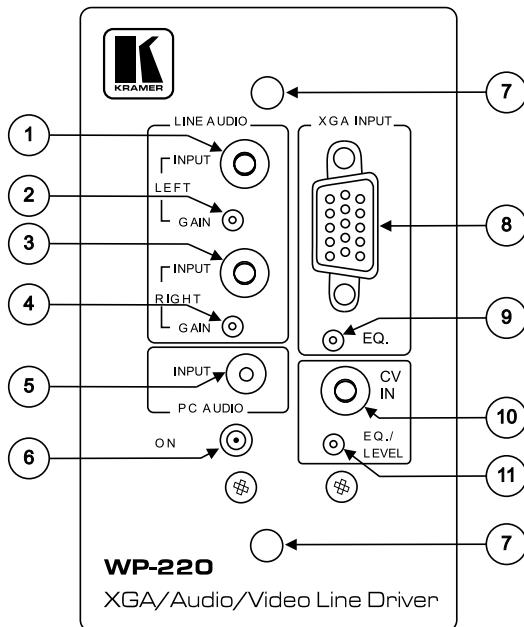
## 4 Your WP-220 XGA/Audio/Video Line Driver

This section defines the **WP-220 XGA/Audio/Video Line Driver**:

- Front panel (see section 4.1)
- Left panel (see section 4.2)
- Right panel (see section 4.3)
- RGBHV Outputs (see section 4.4)

## 4.1 Your WP-220 Front Panel

Figure 1 and Table 1 define the front panel of the **WP-220**:



*Figure 1: WP-220 Front Panel*

*Table 1: WP-220 Front Panel Features*

#	Feature	Function
1	LINE AUDIO LEFT	INPUT RCA Connector
2		Adjusts <sup>1</sup> the left audio output signal level
3	LINE AUDIO RIGHT	INPUT RCA Connector
4		Adjusts <sup>1</sup> the right audio output signal level
5	PC AUDIO INPUT	3.5mm Mini Jack
6	ON LED	Illuminates when receiving power
7	Holes (2)	For fastening the wall plate in place
8	XGA <sup>2</sup> INPUT	HD15F Connector
9	EQ. <sup>3</sup>	Trimmer
10	CV IN	RCA Connector
11	EQ./ LEVEL	Trimmer

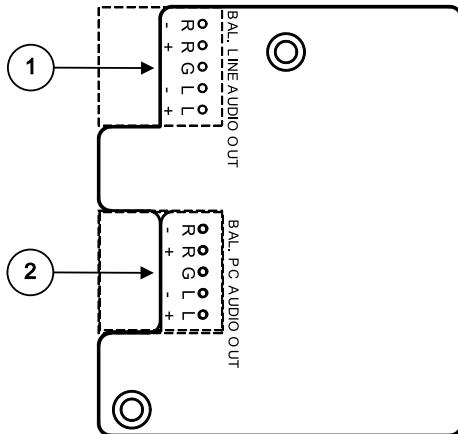
1 Insert a screwdriver into the small hole and carefully rotate it, trimming the appropriate level

2 Can be used for any RGBHV resolution (for example, VGA, XGA, UXGA and so on)

3 Degradation and VGA/XGA signal loss can result from using long cables (due to stray capacitance), sometimes leading to a total loss of sharpness in high-resolution signals

## 4.2 Your WP-220 Left Panel

Figure 2 and Table 2 define the left panel of the **WP-220**:



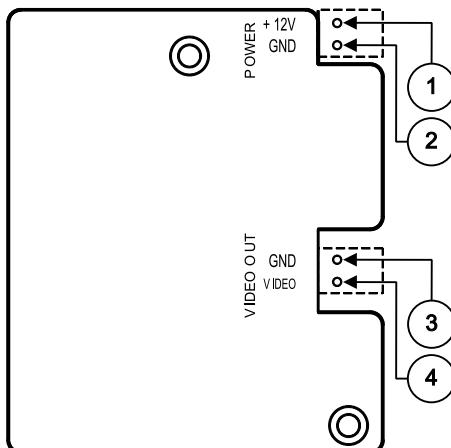
*Table 2: WP-220 Left Panel*

#	Feature	Function
1	Bal. Line Audio Out Terminal Block Connector <sup>1</sup>	Connects to the balanced stereo audio line acceptor <sup>1</sup>
2	Bal. PC Audio Out Terminal Block Connector	Connects to the balanced stereo audio from the PC <sup>1</sup>

*Figure 2: WP-220 Left Panel*

## 4.3 Your WP-220 Right Panel

Figure 3 and Table 3 define the right panel of the **WP-220**:



*Table 3: WP-220 Right Panel*

#	Feature	Function
1	POWER +12V PIN	Connect (+) to the connector for powering the unit
2	GND PIN	Connect (-) to the Ground
3	GND PIN	Connect to the composite video Ground wire
4	VIDEO PIN	Connect to the composite video wire

*Figure 3: WP-220 Right Panel*

<sup>1</sup> Can be used for unbalanced audio. To do this, connect using the "+" and "G" terminal only (leave the "-" terminal unconnected – see section 5.1)

## 4.4 Your RGBHV Outputs

Figure 4 defines the 5 RGBHV BNC output connectors<sup>1</sup> of the **WP-220** which connect to the pre-installed wiring in the wall box opening that connects to the XGA acceptor:

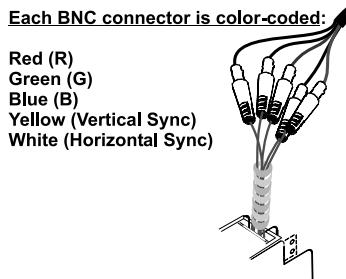


Figure 4: WP-220 RGBHV Outputs

## 5 Using the WP-220 XGA/Audio/Video Line Driver

You can use your **WP-220**, for example, in a conference room, as the example in Figure 5 illustrates:

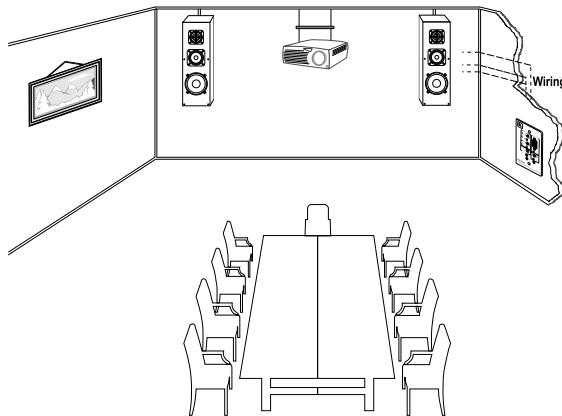


Figure 5: Example of Conference Room WP-220 Installation

For details of how to:

- Install your **WP-220 XGA/Audio/Video Line Driver**, see section 5.1
- Operate your **WP-220 XGA/Audio/Video Line Driver**, see section 5.2

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<sup>1</sup> The WP-220 could be used for component HDTV by connecting YPbPr in place of GBR, and not connecting H and V

## 5.1 Installing the WP-220 XGA/Audio/Video Line Driver

To install your **WP-220 XGA/Audio/Video Line Driver**:

1. Connect the 5 BNC output connectors (each is color-coded: red (R), green (G), blue (B), yellow (Vertical Sync), and white (Horizontal Sync)) to the pre-installed wiring in the wall box opening that connects to the XGA acceptor (for example, a projector).
2. Connect the balanced line / PC audio out terminal block connectors (for example, to power amplifiers) as one of the following:

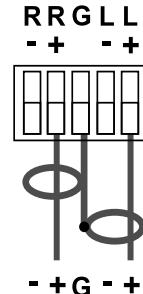
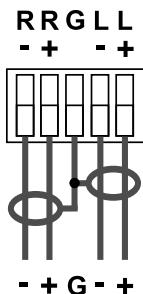


Figure 6: Connect to a Balanced Acceptor

Figure 7: Connect to an Unbalanced Acceptor

3. Connect your 12V DC power supply to the **POWER** pins<sup>1</sup>, taking care that **polarity is correct**.
4. Connect the wires of the coax cable to the **VIDEO OUT** pins<sup>2</sup>, taking care that **polarity is correct**.
5. Insert the **WP-220** directly into the wall box opening, and then mount the front panel securely using the screws.

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<sup>1</sup> Connect the wire labeled “+” to the +12V pin, and the wire labeled “-” to the GND pin

<sup>2</sup> Connect the composite video wire to the VIDEO pin, and the Ground wire to the GND pin (see Figure 8)

## 5.2 Operating the WP-220 XGA/Audio/Video Line Driver

To operate your **WP-220 XGA/Audio/Video Line Driver**:

1. Connect an XGA<sup>1</sup> source (for example, a laptop's digital graphics card) to the Input HD15F connector and to the AUDIO Input 3.5mm mini jack, for example, using a Kramer C-GMA/GMA cable (VGA HD15M +Audio jack to VGA HD15M +Audio jack)<sup>2</sup>.  
Alternatively, you can connect an XGA<sup>1</sup> source to the Input HD15F connector, and a separate audio source to the AUDIO Input.
2. Connect a composite video source (for example, a VCR) to the CV IN RCA connector and to the LINE AUDIO LEFT and RIGHT RCA connectors.
3. Adjust<sup>3</sup> the XGA<sup>1</sup> cable compensation equalization level and/or the CV cable compensation equalization level/output signal level, if required, as well as the right<sup>3</sup> and/or left<sup>3</sup> line audio output signal levels.

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1 Can be used for any RGBHV resolution (for example, VGA, XGA, UXGA and so on)

2 Not supplied. The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com> (click "Cables and Connectors" in the Products section)

3 Insert a screwdriver into the small hole and carefully rotate it, trimming the appropriate level



## Using the WP-220 XGA/Video Line Driver

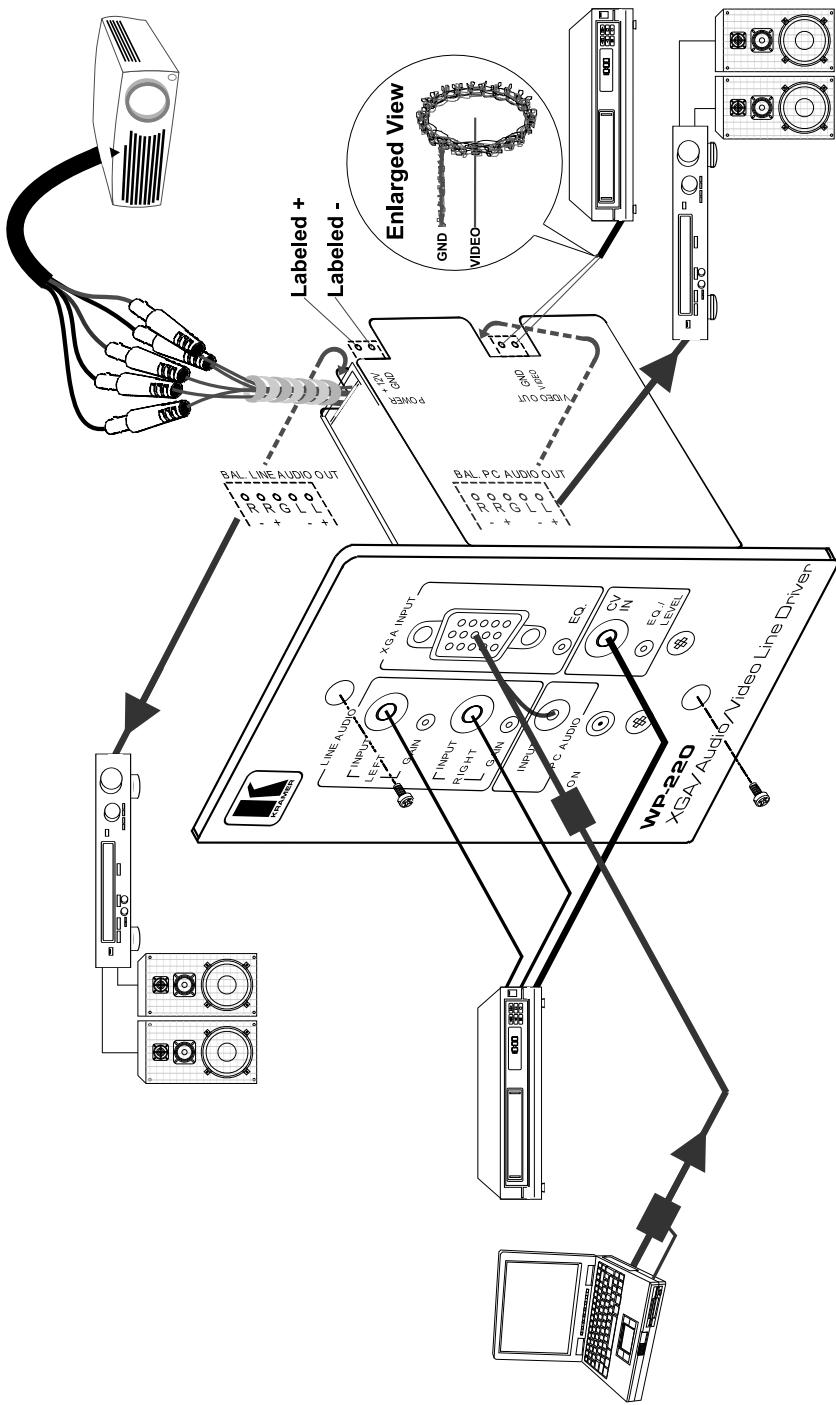


Figure 8: Connecting the WP-220

## 6 Technical Specifications

Table 4 includes the technical specifications:

*Table 4: Technical Specifications<sup>1</sup> of the WP-220 XGA/Audio/Video Line Driver*

INPUTS:	VIDEO: 1 XGA analog red, green, blue signals: 0.7 Vpp/75 Ω, H and V sync, TTL level, on an HD15F connector 1 composite video 1 Vpp/75Ω on an RCA connector	AUDIO: 1 PC unbalanced stereo audio on a 3.5mm mini jack 1 unbalanced stereo line audio on RCA connectors
OUTPUTS:	VIDEO: 1 RGBHV on 5 BNC connectors 0.7 Vpp/75 Ω, RGB TTL level syncs 1 composite video 1 Vpp/75Ω on 2 Pins	AUDIO: 1 PC balanced stereo audio on a terminal block connector 1 line balanced stereo audio on a terminal block connector
MAX. OUTPUT LEVEL:	VIDEO: 2Vpp	AUDIO: 7Vpp
BANDWIDTH (-3dB):	VIDEO: XGA: 500MHz, Fully Loaded CV: 490MHz, Fully Loaded	AUDIO: >100kHz
DIFF. GAIN:	XGA: 0.07% CV: 0.05%	
DIFF. PHASE:	XGA: 0.04 Deg. CV: 0.05 Deg.	
K-FACTOR:	XGA: 0.1% CV: <0.05%	
S/N RATIO:	XGA: 75.1dB CV: 76.7dB	AUDIO: 76.84dB
CROSSTALK (all hostile):	VIDEO: XGA: 63.6dB CV: 64.5dB	AUDIO: -91dB
CONTROLS:	VIDEO: XGA EQ.: 0dB to +4.5dB @ 50MHz CV Level: -1.2dB to +6dB; CV EQ.: 0dB to +1.4dB @ 4.43MHz	AUDIO: Line level: -70dB to +6.2dB
COUPLING:	VIDEO: XGA / CV: DC	AUDIO: AC at input; DC at output
AUDIO THD + NOISE:	0.028%	
AUDIO 2nd HARMONIC:	0.012%	
POWER SOURCE:	12 VDC, 145mA	
DIMENSIONS:	6.9cm x 5.0cm x 11.4cm (2.72" x 1.97" x 4.49", W, D, H)	
WEIGHT:	0.3 kg (0.67 lbs.) approx	
ACCESSORIES:	Power supply	

<sup>1</sup> Specifications are subject to change without notice



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## **LIMITED WARRANTY**

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

### **HOW LONG IS THE WARRANTY**

Labor and parts are warranted for three years from the date of the first customer purchase.

### **WHO IS PROTECTED?**

Only the first purchase customer may enforce this warranty.

### **WHAT IS COVERED AND WHAT IS NOT COVERED**

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site [www.kramerelectronics.com](http://www.kramerelectronics.com).
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
  - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
  - ii) Product modification, or failure to follow instructions supplied with the product
  - iii) Repair or attempted repair by anyone not authorized by Kramer
  - iv) Any shipment of the product (claims must be presented to the carrier)
  - v) Removal or installation of the product
  - vi) Any other cause, which does not relate to a product defect
  - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

### **WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR**

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

### **HOW YOU CAN GET WARRANTY SERVICE**

1. To obtain service on your product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

### **LIMITATION OF IMPLIED WARRANTIES**

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

### **EXCLUSION OF DAMAGES**

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or;
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

**NOTE:** All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081: "Electromagnetic compatibility (EMC); generic emission standard.  
Part 1: Residential, commercial and light industry"

EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.  
Part 1: Residential, commercial and light industry environment".

CFR-47: FCC Rules and Regulations:  
Part 15: "Radio frequency devices  
Subpart B – Unintentional radiators"

### **CAUTION!**

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.



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**For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com).**

Updates to this user manual may be found at  
<http://www.kramerelectronics.com/manuals.html>.  
We welcome your questions, comments and feedback.



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